

The Corliss Group Latest Tech Review: Forget the Shortest Route Across a City; New Algorithm Finds the Most Beautiful

The way we navigate in cities has been revolutionized in the last few years by the advent of GPS mapping programs. Enter your start and end location and these will give you the shortest route from A to B.

That's usually the best bet when driving, but walking is a different matter. Often, pedestrians want the quietest route or the most beautiful but if they turn to a mapping application, they'll get little help.

That could change now thanks to the work of Daniele Quercia at Yahoo Labs in Barcelona, Spain, and a couple of pals. These guys have worked out how to measure the "beauty" of specific locations within cities and then designed an algorithm that automatically chooses a route between two locations in a way that maximizes the beauty along it. "The goal of this work is to automatically suggest routes that are not only short but also emotionally pleasant," they say.

Quercia and co begin by creating a database of images of various parts of the center of London taken from Google Street View and Geograph, both of which have reasonably consistent standards of images. They then [crowdsourced opinions](#) about the beauty of each location using a website called UrbanGems.org.

Each visitor to UrbanGems sees two photographs and chooses the one which shows the more beautiful location. That gives the team a crowdsourced opinion about the beauty of each location. They then plot each of these locations and their beauty score on a map which they use to provide directions.

The idea here is that the user enters a start and end location and an algorithm then finds the [most beautiful route](#), rather than the shortest one. It does this by searching through every possible route, adding the beauty scores for each and choosing the one that ranks highest.

Quercia and co say that on average these routes turn out to be just 12 percent longer than the shortest routes, which makes them reasonable alternatives for a pedestrian.

To work out whether the routes chosen by the algorithm are really more beautiful, Quercia and co recruited 30 people who live in London and are familiar with the area, to assess the recommended paths. And indeed, they agreed that the routes chosen by the algorithm were more beautiful than the shortest routes.

But that's just the start. Crowdsourcing opinion for every possible location in a city is clearly a time-consuming and potentially expensive business. So Quercia and co have automated this process using photos from Flickr and the data and tags attached to them.

They chose some five million pictures taken in the same places as their original photos and then mined the data associated with them to see what parameters correlated with beauty.

Factors that turn out to be a good indicator of beauty are things like the number of pictures taken of a particular scene and comments associated with positive emotions. So looking for locations on Flickr that fulfill this requirement ought to produce a list of beautiful places in any city.

Quercia and co tested this idea in Boston to find beautiful locations on Flickr and then used their algorithm to find the most beautiful path between two locations. They then asked 54 people to evaluate these paths. Sure enough, the participants generally felt that the routes chosen by the algorithm were more beautiful than the shortest parts.

If you know Boston or London yourself, you can evaluate the routes chosen by the algorithms yourself by examining the maps in the paper.

Of course, there are potential problems. Some locations are less attractive at certain times of the day, for example during rush hour when traffic is heavier or at night when the character of some parts the city can change dramatically. The algorithm cannot account for these differences

Nevertheless, this is an interesting approach that has the potential to change the experience people have in interacting with the city. It's not hard to imagine that tourist authorities might use an application like this to help visitors experience the best parts of a city on foot.

Quercia and co have a plan like that. Their next goal is to build a mobile app and test it in the wild across different cities in Europe and the U.S. Keep an eye out for it.